PATENT SPECIFICATION

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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

A Method of Filling Moulds in a Machine for Making Multi-Colour Ice Lollies or Similar Frozen Products

We, BRODRENE GRAM A/S, a body corporate organised and existing under the laws of Denmark, of Vojens, Denmark, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement :—

This invention relates to a method of filling moulds in a machine for making multi-colour ice lollies or similar frozen products in which each mould is filled with successive layers of different liquids by means of a filling tube which is introduced into the mould.

In the making of multi-colour frozen bodies, one method that may be used is first to supply a layer of a liquid to the bottoms of the moulds of the machine, thereafter to freeze the said first layer, then to supply the next layer on top of the frozen first layer, freezing the second layer and continuing in this manner until the whole mould has been filled with a frozen body that is composed of various layers.

This method of proceeding, however, results in a considerable reduction of the capacity of the machine. Thus, if e.g. frozen bodies having three layers of different colours are to be made, three freezing operations are required corresponding to three freezing cycles of the machine or, in other words, in the case of a rotary machine, to three revolutions of the freezing table of this machine.

It is the object of the invention to devise a method by which a substantial increase of the rate of production can be obtained so that this will be approximately the same as that of a machine for filling only one liquid into the moulds. The invention is based on the idea that the various liquid layers are introduced into the moulds on top of each other without any freezing between the successive filling steps, or with a very brief freezing only in between the filling steps. However, when a plurality of liquid layers are to be introduced on top of each other, the difficulty is encountered that when a layer is introduced it will tend to mix with the layer or layers already present in the mould. To avoid this, a method is proposed according to the invention, by which the second and subsequent—if any—layers are introduced via a flow obstructing member located approximately on a level with the surface of the preceding layer. By proceeding in this manner, the layer latest introduced will not mix with the preceding layer or layers, and at the same time the layers already present in the mould are prevented from mixing with one another because the obstructing member will hold back the liquid being supplied at the surface of the layer latest introduced so that the liquid will spread over the surface of that layer without penetrating into same. In order to obtain an efficient retardation or braking of the liquid being supplied, it is proposed, according to the invention, to use a filling tube, the lower end of which is bent to approximately horizontal orientation, the end of said tube being placed, during filling, at a small distance from the wall of the mould at or near which the flow obstructing member is located. By this arrangement, the liquid discharged from the filling tube will impinge on the wall of the mould and will thereby be caused to flow uniformly down the said wall to strike the obstructing member, whereby the liquid is deflected in a horizontal direction so that it will spread on the surface of the layer already present in the mould. According to the invention, a flow obstructing member may be used consisting of a U-shaped strap having its transverse portion projecting under the mouth of the

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tube, but alternatively it is also possible, according to the invention, to use an obstructing member in the form of an edge of frozen liquid produced on the wall of the mould by a brief freezing between the introduction of successive layers followed by withdrawal by suction of a small portion of the layer latest introduced. Finally, a shoulder on the inner wall of the mould may be used as an obstructing member. In the latter case, each of the layers is filled into the mould up to one of the shoulders so that the liquid to form the subsequent layer, when flowing down along the wall of the mould, strikes the shoulder and spreads on the surface of the layer already introduced.

The invention will now be described in further detail with reference to the accompanying drawing, in which figures 1-3 illustrate various stages of one form of carrying out the method according to the invention,

figure 4 an alternative form of a filling tube for use in carrying out the method illustrated in figures 1-3,

figures 5-9 five different stages of a modified form of carrying out the method according to the invention, and

figures 10-12 three stages of a further modified form of carrying out the invention, where a mould having shoulders on its inner wall is used.

In the drawing, 4 is a mould and 5 a filling tube for introducing liquid layers into the mould. In figure 1, a first layer 1 of a liquid of one colour has been introduced into the mould. In order to supply an additional layer 2 of a different colour, the filling tube 5 is introduced into the mould 4 and a U-shaped strap 6 attached to the bottom face of the tube 5 and projecting under the bent mouth of the filling tube is caused to assume a position in contact with or immediately adjacent the wall of the mould. Liquid is then introduced through the tube 5, and this liquid will flow out of the mouth of the tube, strike the wall of the mould, flow downwards and be retarded or obstructed by the strap, whereby the liquid is deflected in a horizontal direction so that the liquid layer 2 is supplied without mixing with the liquid layer 1. Thereafter the filling tube 5 is displaced upwards until the transverse member of the strap is present in the surface of the new layer or immediately adjacent that surface, whereafter a third liquid 3 is introduced until the mould has been completely filled. Instead of employing the same filling tube 5 for all the filling operations, it is of course also possible to use an individual filling tube for each layer. In figure 2, the second layer has been introduced and the filling tube 5 assumes the position in which the liquid of the third layer 3 is being introduced.

Instead of employing a filling tube having a single mouth as illustrated in figures 1-3, a filling tube having two mouths may be employed as illustrated in figure 4, each of said mouths being provided with a strap, so that the liquid to form the layers is introduced at two diametrically opposit zones of the wall of the mould.

Instead of employing a filling tube having a strap so as to cause the liquid to be deflected between the mouth of the filling tube and the top face of the strap and thereby to flow inwards between the mouth and the strap, the baffle effect exerted on the liquid by means of the strap may be replaced by the deflecting effect of an edge of frozen liquid produced in the manner illustrated in figures 5-9. In figure 5, a first layer 1 has been introduced by means of the filling tube 5, and thereafter a brief freezing takes place whereby a shell of the layer 1 is frozen along the wall of the mould. Thereafter a suction tube 7 is introduced into the mould and by means of this a small portion of the still liquid portion of the liquid layer 1 is withdrawn whereby a circumferential edge 8 of frozen liquid is formed. Thereafter the filling tube 5, or another filling tube, is introduced as illustrated in figure 7, in such a manner that its mouth will be located adjacent the wall of the mould whereafter the liquid to form the second layer 2 is introduced. The liquid will strike the wall of the mould, flow down the latter and be horizontally deflected by the edge 8 so that it will not mix with the still liquid portion of the liquid layer 1. Another brief freezing is performed followed by a withdrawal by suction as illustrated in figure 8, whereafter the third layer 3 is introduced as illustrated in figure 9.

According to a still further embodiment, a mould having shoulders 9 may be used as illustrated in figures 10-12, the shoulders 9 forming the members obstructing the flow of the liquid. The first layer is introduced up to the lowermost shoulder 9 as illustrated in figure 10 and thereafter the liquid to form the second layer 2 is introduced, as illustrated in figure 11, and will be deflected by the shoulder 9 so as to spread smoothly on top of the liquid layer 1. After the layer 2 has been introduced up to the next shoulder, the liquid to form the third layer is introduced, as illustrated in figure 12.

WHAT WE CLAIM IS :—

1. A method of filling moulds in a machine for making multi-colour ice lollies or similar frozen products in which each mould is filled with successive layers of different liquids by means of a filling tube which is introduced into the mould, characterized in that the second and subsequent—if any—layers are introduced via a flow obstructing member located approximately on a level with the surface of the preceding layer.

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2. A method as in claim 1, characterized by using a filling tube, the lower end of which is bent to approximately horizontal orientation, the end of said tube being placed, during filling, at a small distance from the wall of the mould, at or near which the flow obstructing member is located.

3. A method as in claim 1, characterized by using, as a flow obstructing member, a U-shaped strap having its transverse portion projecting under the mouth of the tube.

4. A method as in claim 1, characterized by using, as an obstructing member, an edge of frozen liquid produced on the wall of the mould by a brief freezing between the introduction of successive layers followed by withdrawal by suction of a small portion of the layer latest introduced.

5. A method as in claim 1, characterized by using a shoulder on the inner wall of the mould as an obstructing member.

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1 SHEET

COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale.

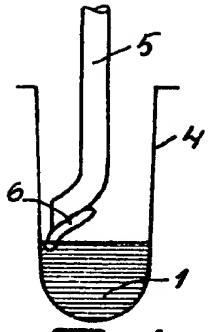

Fig.1

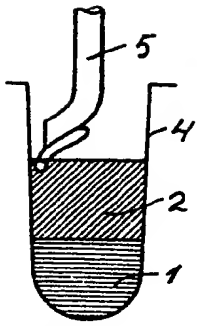

Fig.2

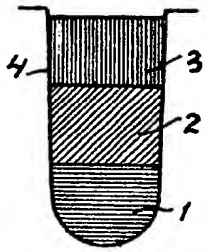

Fig.3

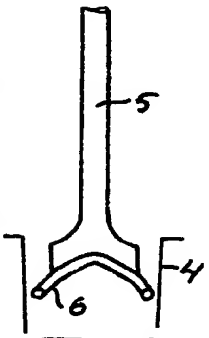

Fig.4

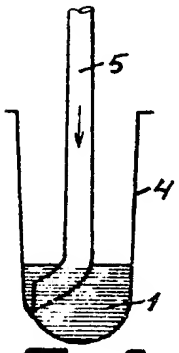

Fig.5

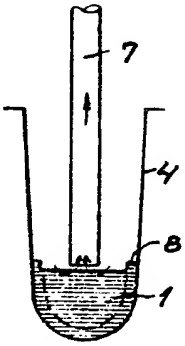

Fig.6

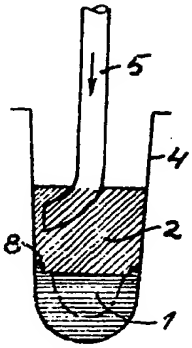

Fig.7

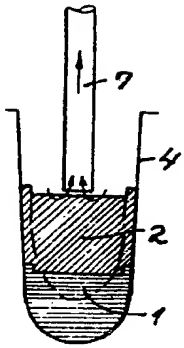

Fig.8

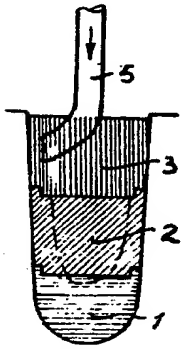

Fig.9

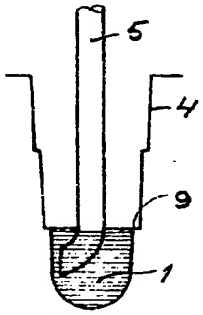

Fig.10

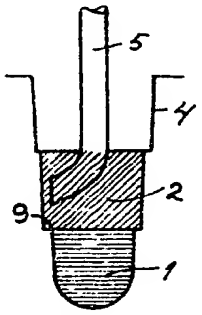

Fig.11

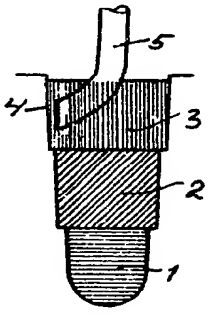

Fig.12

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